

REMARKS

In the Office Action dated September 29, 2005, Claims 1 – 54 are subject to a restriction requirement. The Examiner indicates that applicant is required to select a single species for prosecution. After the careful review of the Office Action, Applicant believes that the claims are generic. Thus, reconsideration and withdraw of the requirement, is respectively requested.

However, in the event that the Examiner disagrees with the arguments below, applicant preliminarily selects the species including Claims 1-8 and 13-24 according to the election required of MPEP § 809.02 and 35 U.S.C. 121.

Claim 1 recites a nonvolatile memory with spacer trapping structure, said nonvolatile memory comprising:

a semiconductor substrate;

a gate oxide formed on said semiconductor substrate;

a control gate structure formed on said gate oxide;

first isolation layer formed over the sidewall of said control gate structure;

first spacers formed on the sidewall of said first isolation layer, wherein said first spacers include charge trapping capability thereby storing single or multiple bits of data;

source and drain regions formed adjacent to said control gate structure, wherein p-n junctions of said source and drain regions formed under said first spacers; and

silicide optionally formed on said control gate structure and said source and drain regions.

Claim 2 recites an additional element of pocket ion implantation to reduce the short channel effect. It is an optional element for the base claim 1. Thus, the main scheme and mechanism of the claim 1, and 2 are identical. Thus, claim 1 is the generic claim to claim 2.

Claim 3 recites additional elements LDD (lightly doped drain) to control the hot carriers and pocket ion implantation to reduce the short channel effect. They are also optional elements for the independent claim. Therefore, the main scheme and mechanism of the claim 1, and 3 are identical. Thus, claim 1 is the generic claim to claim 3. Please refer to the attached document page 1 for example.

Claim 4 recites additional elements DDD (double doped drain) to reduce the junction breakdown effect and pocket ion implant to reduce the short channel effect. Similarly, they are also optional elements for the independent claim. Thus, the main scheme and mechanism of the claim 1, and 4 are also identical. Thus, claim 1 is the generic claim to claim 4.

Claim 5 recites an additional element second isolation layer formed of nitride. It is an alternative embodiment of the invention. Therefore, the main scheme and mechanism of the claim 1, and 5 are identical. Thus, claim 1 is the generic claim to claim 5. Please refer to the attached document page 6 for example.

Claim 6 recites an additional element second isolation layer formed of nitride. It is an optional element for the claim 2. Therefore, the main scheme and mechanism of the claim 2, and 6 are identical. Thus, claim 2 is also the generic claim to claim 6. Please refer to the attached document page 6 for example.

Claim 7 recites an additional element second isolation layer formed of nitride. Similarly, it is an optional element for the claim 3. Therefore, the main scheme and mechanism of the claim 3, and 7 are identical. Thus, claim 3 is the generic claim to claim 7. Please refer to the attached document page 6 for example.

Claim 8 recites an additional element second isolation layer formed of nitride. It is an alternative embodiment for the invention. Thus, the main scheme and mechanism of the claim 4, and 8 are identical. Therefore, claim 4 is the generic claim to claim 8. Please refer to the attached document page 6 for example.

Claim 9 recites an additional element second spacer formed of oxide. Similarly, it is also an optional element for the claim 5. Therefore, the main scheme and mechanism of the claim 5, and 9 are identical. Thus, claim 5 is the generic claim to claim 9. Please refer to the attached reference document page 2 and page 3 for example.

Claim 10 recites an additional element second spacer formed of oxide. Similarly, it is an also optional element for the claim 6. Thus, the main scheme and mechanism of the claim 6, and 10 are identical. Therefore, claim 6 is the generic claim to claim 10. Please refer to the attached reference document page 2 and page 3 for example.

Claim 11 recites an additional element second spacer formed of oxide. It is an alternative embodiment of the invention. Therefore, the main scheme and mechanism of the claim 7, and 11 are identical. Thus, claim 7 is the generic claim to claim 11. Please refer to the attached reference document page 2 and page 3 for example.

Claim 12 recites an additional element second spacer formed of oxide. Similarly, it is also an optional element for the claim 8. Thus, the main scheme and mechanism of the claim 8, and 12 are identical. Thus, claim 8 is the generic claim to claim 12. Please refer to the attached reference document page 2 and page 3 for example.

Claims 13-15 are dependant on the claim 1, therefore claim 1 is the generic claim to claims 13-15.

Claims 16-18 are dependant on the claim 2, therefore claim 2 is the generic claim to claims 16-18.

Claims 19-21 are dependant on the claim 3 therefore claim 3 is the generic claim to claims 19-21.

Claims 22-24 are dependant on the claim 3 therefore claim 4 is the generic claim to claims 22-24.

Claim 25 recites a nonvolatile memory with spacer trapping structure, said nonvolatile memory comprising:

a semiconductor substrate;

a gate oxide formed on said semiconductor substrate;

a control gate structure formed on said gate oxide, wherein said control gate structure comprises a stacked structure including of polysilicon layer/silicide layer and a first dielectric layer;
a second dielectric layer formed on the sidewall of said control gate structure and the surface of said semiconductor substrate;
first spacers formed on the sidewall of said second dielectric layer, wherein said first spacers include charge trapping capability thereby storing single or multiple bits of data;
and
source and drain regions formed adjacent to said control gate structure, wherein p-n junctions of said source and drain regions formed under said first spacers.

Claim 26 recites an additional element pocket ion implantation to reduce the short channel effect. It is an optional element for the base claim 25. Thus, the main scheme and mechanism of the claim 25, and 26 are identical. Thus, claim 25 is the generic claim to claim 26.

Claim 27 recites additional elements LDD (lightly doped drain) to control the hot carriers and pocket ion implantation to reduce the short channel effect. They are also optional elements for the independent claim. Therefore, the main scheme and mechanism of the claim 25, and 27 are identical. Thus, claim 25 is the generic claim to claim 27.

Claim 28 recites additional elements DDD (double doped drain) to reduce the junction breakdown effect and pocket ion implant to reduce the short channel effect. Similarly, they are optional elements for the independent claim. Thus, the main scheme and mechanism of the claim 25, and 28 are identical. Thus, claim 25 is the generic claim to claim 28.

Claim 29 recites an additional element third dielectric layer formed of nitride. It is also an optional element for the claim 25. Thus, the main scheme and mechanism of the claim 25, and 29 are identical. Therefore, claim 25 is the generic claim to claim 29.

Claim 30 recites an additional element third dielectric layer formed of nitride. It is an alternative embodiment of the invention. Therefore, the main scheme and mechanism of the claim 26, and 30 are identical. Thus, claim 26 is the generic claim to claim 30.

Claim 31 recites an additional element third dielectric layer formed of nitride. It is an optional element for the claim 27. Thus, the main scheme and mechanism of the claim 27, and 31 are identical. Thus, claim 27 is the generic claim to claim 31.

Claim 32 recites an additional element third dielectric layer formed of nitride. Similarly, it is an optional element for the claim 28. Therefore, the main scheme and mechanism of the claim 28, and 32 are identical. Thus, claim 28 is the generic claim to claim 32.

Claim 33 recites an additional element second spacer formed of oxide. It is an alternative embodiment for the invention. Thus, the main scheme and mechanism of the claim 29, and 33 are identical. Thus, claim 29 is the generic claim to claim 33. Please refer to the attached reference document page 2 and page 3 for example.

Claim 34 recites an additional element second spacer formed of oxide. Similarly, it is also an optional element for the claim 30. Therefore, the main scheme and mechanism of the claim 30, and 34 are identical. Thus, claim 30 is the generic claim to claim 34. Please refer to the attached reference document page 2 and page 3 for example.

Claim 35 recites an additional element second spacer formed of oxide. Similarly, it is an optional element for the claim 31. Thus, the main scheme and mechanism of the claim 31, and 35 are identical. Therefore, claim 31 is the generic claim to claim 35. Please refer to the attached reference document page 2 and page 3 for example.

Claim 36 recites an additional element second spacer formed of oxide. It is an alternative embodiment of the invention. Therefore, the main scheme and mechanism of the claim 32, and 36 are identical. Thus, claim 32 is the generic claim to claim 36. Please refer to the attached reference document page 2 and page 3 for example.

Claim 37-40 are dependant on the claim 25, therefore claim 25 is the generic claim to claims 37-40.

Claim 41-44 are dependant on the claim 26, therefore claim 26 is the generic claim to claims 41-44.

Claim 45-48 are dependant on the claim 27, therefore claim 27 is the generic claim to claims 45-48.

Claim 49-52 are dependant on the claim 28, therefore claim 28 is the generic claim to claims 49-52.

Conclusion

In view of the forgoing, claims 1 - 52 pending in the application comply with the requirements of MPEP § 809.02. The withdrawal of the restriction requirement is, therefore, respectively requested.

A Petition for a one-month extension of time and requisite fee are enclosed. However, if any additional fee is due for consideration of this response, please charge our Deposit Account No. 50-0665, under Order No. 386998041US from which the undersigned is authorized to draw.

Dated: November 29, 2005

Respectfully submitted,

By 

Chun M. Ng

Registration No.: 36,878

PERKINS COIE LLP

P.O. Box 1247

Seattle, Washington 98111-1247

(206) 359-8000

(206) 359-7198 (Fax)

Attorneys for Applicant